
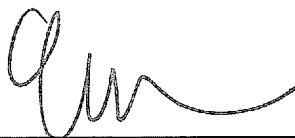


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<b>PRE-APPEAL BRIEF REQUEST FOR REVIEW</b>		Docket Number (Optional) <b>5308-413</b>	
<b>CERTIFICATION OF ELECTRONIC TRANSMISSION UNDER 37 C.F.R. §1.8</b> I hereby certify that this correspondence is being transmitted electronically to the U.S. Patent and Trademark Office on April 30, 2007.  Erin C. Dutton Date of Signature: April 30, 2007		Application Number <b>10/849,617</b>	
		Filed <b>May 20, 2004</b>	
		First Named Inventor <b>Adam William Saxler</b>	
		Art Unit <b>2822</b>	
		Examiner <b>Duong, Khanh B.</b>	
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s).          Note: No more than five (5) pages may be provided.</p>			
I am the <input type="checkbox"/> applicant/inventor. <input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96) <input checked="" type="checkbox"/> attorney or agent of record. Registration number <b>48,568</b> <input type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____		 _____ Signature <b>Elizabeth A. Stanek</b> _____ Typed or printed name <b>(919) 854-1400</b> _____ Telephone number <b>April 30, 2007</b> _____ Date	
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.			
<input type="checkbox"/> *Total of _____ forms are submitted.			

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Saxler *et al.*

Serial No.: 10/849,617

Filed: May 20, 2004

For: **METHODS OF FABRICATING NITRIDE-BASED TRANSISTORS HAVING  
REGROWN OHMIC CONTACT REGIONS**

Confirmation No.: 9882

Group Art Unit: 2822

Examiner: Duong, Khanh B.

Date: April 30, 2007

Mail Stop AF

Commissioner for Patents

Box 1450

Alexandria, VA 22313-1450

**REASONS IN SUPPORT OF APPLICANTS' PRE-APPEAL  
BRIEF REQUEST FOR REVIEW**

Sir:

This document is submitted in support of the Pre-Appeal Brief Request for Review filed concurrently with a Notice of Appeal in compliance with 37 C.F.R. 41.31 and with the rules set out in the OG of July 12, 2005 for the New Appeal Brief Conference Pilot Program, which was extended until further notice on January 10, 2006.

No fee or extension of time is believed due for this request beyond those requested in papers associated herewith. However, if any fee or extension of time for this request is required, Applicants request that this be considered a petition therefor. The Commissioner is hereby authorized to charge any additional fee, which may be required, or credit any refund, to our Deposit Account No. 50-0220.

**REMARKS**

Applicants hereby request a Pre-Appeal Brief Review (hereinafter "Request") of the claims finally rejected in the Final Action of October 30, 2006 (hereinafter "Final Action") and the Advisory Action mailed April 4, 2007 (hereinafter "Advisory Action"). The Request is provided herewith in accordance with the rules set out in the OG dated July 12, 2005.

Claims 63-67, 71, 72, 74-76, 79 and 80 stand rejected under 35 U.S.C. §102(b) as being anticipated by United States Patent No. 6,534,801 to Yoshida *et al.* (hereinafter "Yoshida"). *See* Final Action, page 3. Claims 77 and 78 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of Matsumoto. *See* Final Action, page 5. Claims 1, 5-8, 13, 15-21, 23 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of United States Patent No. 5,701,019 to Matsumoto *et al.* (hereinafter "Matsumoto"). *See* Final Action, page 7. Claims 2-4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of Matsumoto and in further

Applicants respectfully submit that many of the recitations of the pending claims are not met by the cited references for at least the reasons discussed herein and in Applicants' previously filed Amendment and Request for Reconsideration After Final of January 2, 2007.

Furthermore, Applicants submit that the Final Action and/or the Advisory Action have not shown that the claims are obvious in view of the cited references. Therefore, Applicants respectfully request review of the present application by an appeal conference prior to the filing of an appeal brief. In the interest of brevity and without waiving the right to argue additional grounds should this Petition be denied, Applicants will only discuss the recitations of the independent Claims 1 and 63.

For the record, Applicants submit that Claims 9-12, 22 and 25-45 are allowed. *See* Advisory Action, Section 7, Claim(s) allowed. Furthermore, neither the Final Action nor the Advisory Action specifically rejects dependent Claims 14, 68-70 or 73, thus, Applicants submit that these claims are separately patentable over the cited references for at least these reasons.

For example, independent Claim 1 recites:

A method of fabricating a transistor, comprising:  
forming a nitride-based channel layer on a substrate;  
forming a barrier layer on the nitride-based channel layer;  
forming a contact recess in the barrier layer to expose a contact region of the nitride-based channel layer;  
**forming a contact layer on the exposed contact region of the nitride-based channel layer using a low temperature deposition process, such that the contact layer does not extend beneath the barrier layer;**  
forming an ohmic contact on the contact layer; and  
forming a gate contact disposed on the barrier layer adjacent the ohmic contact.

Applicants respectfully submit that at least the highlighted recitations of independent Claim 1 are neither disclosed nor suggested by the cited combination for at least the reasons discussed herein.

In particular, the Final Action states that all of the recitations of independent Claim 1 are taught by Figures 1 through 5 of Yoshida except that Yoshida does not disclose forming the contact layer such that the contact layer does not extend beneath the barrier layer. *See* Final Action, page 7. However, the Final Action points to Matsumoto as providing the missing teachings. *See* Final Action, page 8. Applicants respectfully disagree.

The Final Action states that the GaN layer 5 of Yoshida teaches the contact layer as recited in independent Claim 1. *See* the Final Action, page 7. As discussed in Yoshida:

Thereafter, **a selective growth method, for example, is used to form the n-type GaN layer** on the exposed undoped GaN layer 3, using Si, for example, as the n-type impurity. Simultaneously, the undercut portion 4a is buried by the n-type GaN (FIG. 5). . .

Thereafter, **a selective growth was effected by using metal Ga ( $5 \times 10^{-7}$  Torr) as a Ga source, ammonia ( $5 \times 10^{-6}$  Torr) as an N source and Si ( $5 \times 10^{-8}$  Torr) as an n-type impurity, thereby burying the undercut portion 4a and forming an n-type GaN layer 5 with a thickness of 40 nm, as shown in FIG. 5.**  
The Si concentration in the n-type GaN layer was  $2 \times 10^{19} \text{ cm}^{-3}$ .

See Yoshida, column 4, lines 11-16 and column 5, lines 9-15 (emphasis added). Thus, the GaN layer of Yoshida is formed using a "selective growth method" as discussed therein. In stark contrast, Claim 1 recites "forming a contact layer on the exposed contact region of the nitride-based channel layer **using a low temperature deposition process.**" Nothing in Yoshida discloses or suggests using such a low temperature deposition process to form the contact layer.

Matsumoto does not provide the missing teachings. In fact, the Final Action admits that Matsumoto does not disclose the "low temperature process" as recited in the claims of the present application. See Final Action, page 11.

As discussed above, the Final Action admits that Yoshida does not disclose or suggest forming the contact layer such that the contact layer does not extend beneath the barrier layer. See Final Action, page 7. The Final Action points to Figure 3(d) of Matsumoto as providing the missing teachings. See Final Action, page 8. Applicants respectfully submit that there is no motivation or suggestion to combine the cited references as suggested in the Final Action.

The Final Action states:

Since Yoshida and Matsumoto are from the same field of endeavor, the purpose disclosed by Matsumoto would have been recognized in the pertinent prior art of Yoshida.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method disclosed by Yoshida as suggested by Matsumoto because of the desirability to minimize the capacitance between the gate and drain.

See Final Action, page 8. Applicants respectfully disagree.

The motivation provided in the Final Action set out above is, at most, a motivation based on "subjective belief and unknown authority," the type of motivation that was rejected by the Federal Circuit in *In re Sang-su Lee*. In other words, the Final Action does not point to any specific portion of the cited references that would induce one of skill in the art to combine the cited references as suggested in the Final Action. If the statement in the Office

capacitance between the gate and drain" would be rendered obvious. This cannot be the case. Thus, it appears that the Final Action gains its alleged impetus or suggestion to combine the cited references by hindsight reasoning informed by Applicants' disclosure, which is an inappropriate basis for combining references.

Furthermore, as discussed in Matsumoto:

A fabrication method according to the present invention employs a step of forming a surface oxide film 10 by oxidizing **the side surfaces of the n-type GaAs channel layer 3 and side surfaces of the undoped AlGaAs barrier layer 4 that are exposed by etching**, a step of selectively removing the surface oxide film 10 from the side surfaces of the channel layer 3 while leaving the surface oxide film formed on the side surfaces of the barrier layer 4, and a step of selectively growing the contact layer 6 on the regions inclusive of side surfaces of the channel layer 3 by using, as a mask, the surface oxide film 10 that is left on the side surfaces of the barrier layer **Thus, the contact layer is formed so as not to be in contact with the side surfaces of the barrier layer 4.**

See Matsumoto, column 3, lines 9-30. In other words, the contact layer 6 of Matsumoto is formed so that it does not contact the side surfaces of the barrier layer 4. See also Figure 3(d) of Matsumoto. Furthermore, this lack of contact with the barrier layer 4 is the aspect of Matsumoto that may enable "capacitance between the gate and drain to be decreased." See Matsumoto, Abstract. As is clearly illustrated in Yoshida, the GaN layer (contact layer) 5 clearly contacts the side surface of the undoped AlGaN layer (barrier layer) 4 and the undoped AlGaN layer 5 extends beneath the GaN layer 5. Accordingly, Applicants respectfully submit that one of skill in the art would not be motivated to combine the cited references for at least these additional reasons.

Accordingly, Applicants respectfully submit that none of the cited references, either alone or in combination, disclose or suggest at least these recitations of Claim 1 and, thus, Claim 1 and the claims that depend therefrom are in condition for allowance for at least the reasons discussed herein.

By way of further example, independent Claim 63 recites:

A method of fabricating a high electron mobility transistor, comprising:  
forming a nitride-based channel layer on a substrate;  
forming a barrier layer on the nitride-based channel layer;  
forming at least one contact recess in the barrier layer that extends into the channel layer;  
forming a contact region on the nitride-based channel layer in the contact recess;  
forming a gate contact disposed on the barrier layer; and  
**wherein forming the contact region and forming the nitride-based channel layer include forming the contact region and forming the nitride-based**

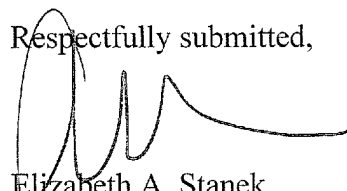
Applicants respectfully submit that at least the highlighted recitations of independent Claim 63 are neither disclosed nor suggested by Yoshida for at least the reasons discussed herein.

The Final Action points to undercut portions 4a of Yoshida as teaching the highlighted recitations of independent Claim 63. *See* Final Action, page 3. The undercut portions 4a of Yoshida are provided so "that a good electric conduction can be obtained between the two-dimensional electron gas layer." *See* Yoshida, column 4, lines 16-17. Nothing in Yoshida discusses the use of the undercut portions 4a as a surface area enlargement structure. In fact, nothing in Yoshida even mentions surface area enlargement. As discussed above, anticipation requires that each and every element of a claim be taught by a single reference. Yoshida, on its face, clearly does not anticipate Claim 63 for at least the reasons discussed herein.

Applicants respectfully submit that Claim 63 and the claims that depend therefrom are patentable over Yoshida for at least the reasons discussed herein. Accordingly, Applicants respectfully request allowance of these claims in due course.

Accordingly, for at least these reasons, Applicants respectfully submit that the Final Action fails to show that the claims of the present application are obvious in view of the cited references and, therefore, request that the present application be reviewed and that the rejections be reversed by the appeal conference prior to the filing of an appeal brief.

Respectfully submitted,

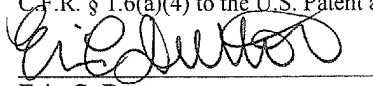


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**CERTIFICATION OF TRANSMISSION**

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with 37 C.F.R. § 1.6(a)(4) to the U.S. Patent and Trademark Office on April 30, 2007.



Erin C. Dutton

Date of Signature: April 30, 2007